# Government Risks, Government Reforms and Restoring Prosperity: The Macroeconomics of Health.

Stanford Conf. on Restoring Prosperity

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Restoring Prosperity via Optimal Government Reform



#### Outline



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#### 3 Conclusion

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# **Financial Health Economics**

- **KPU '16**: Koijen-Philipson-Uhlig (2016), "Financial Health Economics", Econometrica vol. 84, no. 1, 195-242.
- Question there: why do health stocks have "alpha"?
- Answer: **government risks**. I.e., "alpha" is the investor reward for holding government intervention risk ("socialized medicine").
- Cruz-Sanders CNN Debate, "Future of Obama Care", Tue Feb-7.
- Without gov. interv. risk ( partial government reform ):
  - doubling of medical R&D by now.
  - additional 3% of GDP would be spent on health care.
  - Iong-run health share: 30 to 40 percent.
- Model in **KPU** '16: lots of distortions. Gov. interv. risk is just one.
- **Issue:** Is reducing intervention risk a step in the right direction? Benchmark: **optimal government reform**.
- Today: long run social planner solution in **KPU** '16. Comparison.

## **Trump Election Day Returns**



# Cumulative Abnormal Returns vis-a-vis "beta" 60 days prior.





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## **Trump Policy and Hospital Shares**

#### Trump Win Sends Hospital Shares Into Cardiac Arrest; Drug Wholesalers Rise



Shares of Tenet lost a quarter of their value as it appeared Obamacare would be dismantled by incoming President Trump. (Kris Tripplaar/Sipa USA/Newscom)

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he coming presidency of Donald Trump and the near-certain prospect he will try to unravel President Obama's Affordable Care Act sent shares of hospital stocks into cardiac arrest in Wednesday trading, while major insurers were mixed and drug wholesalers enjoyed a revival.

#### Trump Policy and Drug Stock Prices



PHOTO NUTERS

By CHRIS DIETERICH AND PETER LOFTUS Dec 7, 2016 6:05 pm ET . 12 COMMENTS

While most U.S. stocks rallied on Wednesday, shares of biotechnology and pharmacentical companies retreated after President-elect Donald Trump vowed in a magazine article to crack down on drug prices.

Drug stocks fell after Mr. Trump was quoted in a Time Person of the Year article as saying: "Tin going to bring down drug prices."

Pfizer Inc., Johnson & Johnson and Merrik & Co. were the only three stocks in the 30 member Dow Jones Industrial Average to lose ground, though each required the worst of early-day declines. The 82.8 billion SPDB 88.4P Biotech exchange traded fund, which tracks a basket of stocks including Celepters Corp. and Biogen Inc., tumbled 4%.

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#### **Optimal Health Economics**

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# Health Share, R&D Share: Model Versus Data



# Health Share, R&D Share: Counterfactual



# Health Share, R&D Share: Long Run



# **KPU** '16' the model $t = 0, 1, 2, \dots$ Two types: households, entrepreneurs. HH utility: $U = E\left|\sum_{t=1}^{\infty} \beta^{t} \frac{(c_{t}^{\xi} h_{t}^{1-\xi})^{1-\eta} - 1}{1-\eta}\right|$ cons.: $C_t + \kappa e_t = \gamma^t L_{ct}$ $h_t = \gamma^t \underline{h} + m_t$ (with <u>h</u>: health endowm.) health: $m_t = \left(\int_0^1 m_{jt}^{1/\phi} dj\right)^{\phi}$ medic. cons.: $m_{jt} = q_{it}\gamma^t L_{m.i.t}$ variety *j*: $q_{i,t+1} = (q_{i,t}^{\nu} + d_{i,t}^{\nu})^{1/\nu}$ quality of *i*:

R&D for *j*:  $d_{j,t} = \gamma^t L_{d,j,t}$ labor market: 1  $= L_{c,t} + \int_0^1 L_{m,j,t} dj + \int_0^1 L_{d,j,t} dj$ 

# KPU '16: the distortions

- Asset market distortion: Households cannot save or borrow.
- **Markup distortion:** *m*<sub>*j*,*t*</sub> is produced in monopolistic competition. Thus, the price is at a markup over marginal costs, generating profits.
- Knowledge spillover distortion: Firm *j* does R&D *d<sub>j,t</sub>* in *t* anticipation of these profits in *t* + 1. It then dies, leaving the new quality level *q<sub>j,t+1</sub>* "for free" to next generation of firms. (Note: *t* counts decades.)
- Medical care subsidy: The government subsidizes the medical spending of HH.
- **R&D subsidy:** The government subsidizes firms' R&D spending.
- Government intervention risk: The government may impose that all future markups are zero. Firms take this risk into account, when making their R&D choice today.

#### Outline





#### 3 Conclusion

# Restoring Prosperity via Optimal Government Reform

- Optimal Government Reform = Social Planning Problem.
- Let's run with the model in KPU '16.
- Solve a social planner (SP) problem, who only cares about households.
- SP: chooses optimal allocation, subject to equations above and  $e_t \ge 0$ .
- Symmetry:  $m_{j,t} \equiv m_t$ ,  $q_{j,t} \equiv q_t$ ,  $d_{j,t} \equiv d_t$ .
- Long run only:
  - Set  $\underline{h} = 0$ . Note that  $\underline{h}$  "fades" as  $q_t \to \infty$ .
  - Characterize balanced growth path.
- Quantitatively compare to market outcome in KPU '16.

# Results 1: balanced growth.

#### Proposition

Along the balanced growth path,

- $q_{t+1}/q_t = \gamma$ .
- Thus,  $m_t = h_t$  grows twice as fast as consumption,

$$m_t = h_t = h_0 \gamma^{2t}$$

while

$$oldsymbol{c}_t = oldsymbol{c}_t \gamma^t, \ oldsymbol{q}_t = oldsymbol{q}_0 \gamma^t, \ oldsymbol{d}_t = oldsymbol{d}_0 \gamma^t$$

• The ratio of R&D to the quality level is

$$\left(\frac{\bar{d}}{q}\right) = (\gamma^{\nu} - 1)^{1/\nu} = 0.0084$$
 with **KPU** '16 calibration

#### Results 2: parameters.

Param.	Description	
	These matter in <b>KPU</b> '16 and here:	
$\gamma$	10-yr growth	$1.35 = 1.03^{10}$
ν	Curvature R&D production function	0.42
ξ	Weight non-health consumption in U	0.54
	These only matter in KPU '16:	
$\phi$	Markup	3
$\chi$	R&D subsidy	50%
$\sigma$	Medical care subsidy	50%
R	10-yr benchmark return	$1.48 = 1.04^{10}$
Q	10-yr ret. on health R&D, if no interv.	2.37
	These only matter here:	
$\beta$	HH or SP discount factor	benchm.: 1/R
$\eta$	utility curvature	benchm.: 1

## Results 3: numerical results, benchmark parameters.

Benchmark parameters:  $\beta = 1/R$ ,  $\eta = 1$ . Results:

	Market, i.e. KPU '16		Optimal,
	w. gov. risk	no gov. risk	i.e. here
R&D spending/GDP	1.5%	2.3 %	6.7%
health spending/GDP	32%	32%	34%

Decentralization in original KPU '16 model

	Market, i.e. KPU '16		Optimal,
	w. gov. risk	no gov. risk	i.e. here
Medical care subsidy $\sigma$	50%	50%	71%

## Results 4: large sensitivity to parameter variation.

Optimal share of labor force in medical R&D:



#### Outline



#### Restoring Prosperity via Optimal Government Reform



## Conclusions

- Health expenditures: large and rising share of GDP.
- **KPU '16**: government risks! Source of health industry "alpha". Without gov. interv. risk ( partial government reform ):
  - doubling of medical R&D by now.
  - additional 3% of GDP would be spent on health care.
  - Iong-run health share: 30 to 40 percent.
- ... but is this a step in the right direction?
- Restore prosperity with optimal government reform.
- Social planner problem, long run, in KPU '16. Results:
  - ► For benchmark parameters, triple R&D ...
  - ... and results are **very** dependent on choice for  $\beta$ ,  $\eta$ .
  - Decentralizable with subsidies and taxes.
- Appropriate model?
- This is of first-order importance. More research truly is needed.